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RECENT PUBLICATIONS.

REVIEWS.

Descartes Savant. By GASTON MILHAUD, late professor at the Sorbonne. Paris, Felix Alcan, 1921. 252 pages.

In the death of Gaston Milhaud, in October, 1918, France lost one of her best-known writers on the history of philosophy, particularly as related to the exact sciences. He had contributed to our knowledge of the origins of Greek science, to the history of the philosopher-geometers of Greece, to a study of scientific thought in the classical and the modern periods, and to various other lines having to do with the development of the human spirit. He also wrote, for various reviews, a number of articles upon the life and works of Descartes, and later arranged and amplified these for publication in book form. The present volume, published posthumously, represents, therefore, all of M. Milhaud's various monographs upon this great scholar, together with the lectures relating to him which he gave at the Sorbonne in 1917 and 1918.

Students of the history of mathematics have heretofore had to depend chiefly upon the biographies written by J. Millet (Paris, 1867), Elizabeth S. Haldane (London, 1905), and C. Adam (Paris, 1910). Valuable as these were, they were not written with the philosophic insight that characterizes the work of M. Milhaud, primarily for the reason that the latter was himself interested in philosophy to the same degree as in mathematics.

Perhaps the most striking topic treated by M. Milhaud is the one which forms the introduction—the question of the sincerity of Descartes. Some further idea of the work may be obtained from the titles of the several chapters, as follows: I. The first scientific ventures of Descartes; II. A "crise mystique" of Descartes in 1619; III. Descartes's work during the winter of 1619–1620; IV. The event which recalls the date of November 11, 1620; V. His works on optics (1620–1629); VI. The problem of Pappus and the analytic geometry (1631); *La Geômêtrie* (1637); VII. The quarrel between Descartes and Fermat on the subject of tangents; Descartes and the infinitesimal analysis; VIII. Descartes and the concept of work; IX. Descartes the experimenter; X. Descartes and Bacon; XI. The double aspect of the scientific work of Descartes.

It will be observed, by considering these titles, that M. Milhaud realized the value of arousing the curiosity of his readers. There is just enough of concealment in his captions to entice the student to solve the mystery by reading each chapter in turn. The reader who is not already familiar with M. Adam's treatise will wonder what happened on November 11, 1620, what the dispute was between Descartes and Fermat, what question of sincerity could arise as to Descartes's work, and what the "double aspect" really means. This is a species of literary dexterity that is entirely excusable; indeed, when a man has written really something worth reading, it is a laudable method, and no people are more gifted in its use than the French.

The work is a scholarly production and a welcome addition to the biographies of the giants upon whose shoulders Newton so generously confessed that he had stood in viewing the universe, to the study of the laws of which he so extensively contributed.

DAVID EUGENE SMITH.

Practical Least Squares. By O. M. LELAND. New York, McGraw-Hill Book Company, 1921. 8vo. 14 + 237 pages. Price $3.00.

The following extracts from the preface will indicate the purpose and plan of this textbook on the subject of Least Squares:

> "It is designed particularly for use in short courses of instruction and by engineers and scientists in connection with their private practice. It will not replace the more elaborate treatises on the subject but the author hopes that it will introduce the student directly to the simpler methods of solving the ordinary problems in adjustment.
>
> "The plan of the work is essentially practical. . . . By far the greater number of applications of Least Squares do not require a consideration of the precision of the results nor a knowledge of the mean square or probable errors. Moreover the subject of precision is usually the most troublesome part of the work for the student or the beginner to understand. Therefore, the practical methods of adjustment are explained directly and fully, without regard to the probable errors or to the theoretical derivation of the Law of Error."

As an introductory text, this book may be recommended on the basis of the following excellent features: the material is well graded, the text is illustrated by numerous examples, the explanation is always clear, and is mingled with a judicious amount of suggestion and of warning; in fact, a more simple presentation for the use of private study could not be asked. There are other points that might be suggested in possible criticism. The style throughout suggests the well-delivered lecture, and is not primarily designed for ready reference. There are no theorems so labelled, no isolated definitions, and worst of all, no problems for solution. Except for the language employed and for the gradual development, there is little if anything original in the treatment. One would almost suppose that the subject was as fossilized as elementary trigonometry. The mathematical features of theoretical interest are relegated to the Introduction and to the Appendices, and are treated with so little concern for logic that any critical reader might have preferred their entire omission. Since the book is intended to be available for a brief course of sixteen lessons, the student is not likely to suffer much from the shortcomings of the supplementary remarks upon the theory underlying the subject.

The work is not intended as a contribution to the development of science, and many questions that would lead into larger fields are avoided in connections that would seem to justify at least a hint for the encouragement of the ambitious or inquiring student, but the author has been generous in his references to easily available American texts, and to one or two classical treatises in foreign languages.

ALBERT A. BENNETT.